Future of Industrial Construction Technology Must Be a Revolution Not an Evolution

AI is in its Early Development Stages — Now is the time to Shape the Technology for your Project's Needs

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Image above: Production plant in Hungary

How can the future of construction be shaped? As a slow evolution or as an innovative revolution? Slow evolution in construction has been tried for many years with poor results. Now is the time for an innovative revolution.

We at Prilhofer Consulting have been active in the field of industrial construction technology for more than 30 years. In this long time we have seen many different approaches to change the construction industry. And we have been able to accompany and advise producers of prefabricated parts from simple production units to fully automated factories using state-of-the-art technology, helping them to be more successful.

Automation began in the late 1980s when personal computers, CAD systems and PLCs became available and affordable. At that time, it was a revolution to use data directly from the personal computer in the machine without printing information (data) in production. Over the years, we have observed many success stories, but also companies that have failed in the field of automation.

What were the reasons for the failure? Poor preparation for the use of automation. In other words, no industrial environment and no adaptation in the organization within the company. Why have other companies been successful? Because these companies have

Prefab timber wall in Slovak Republic

recognized that industrial production and automation have a lot to do with organization and data.

The product, i.e. the building that will be constructed, also has an impact. It is not so easy to transfer the processes from the building site to pre-construction. The processes and procedures have to be adjusted. The benefits of automation can only be fully exploited in an industrial environment and with a product that is adapted to industrial production.

This insight is not new. Other industries have been planning and producing according to this principle for a long time. And we love products such as cell phones and cars which are produced 100% in an industrial way.

The use of automation as an island within the traditional construction methods only leads to increased costs. Why is that happening? To serve both trades (automation and traditional), a double infrastructure is required. But double infrastructure costs double money. And in the rarest of cases, this increases efficiency on the building site.

The solution is to take an industrial approach and not a traditional one when designing the building. At the beginning of planning a building, it must be clear how it will be built and with which material in order to take advantage of the material and construction method.

This is, of course, very important if a building will be built in an industrial way. Otherwise, the advantages of industrial construction are lost. What is not a major problem in traditional construction methods must be redesigned for industrial construction methods.

DIGITALISATION

Digitalisation is the key to more efficiency and better quality in the construction industry. However, digitalization in the construction industry must not be an end in itself. When creating data, 100% of the data must be used to be efficient.

Creating a PDF document is not the right way to use data because it is not much different than using paper. This will not lead to more efficiency on the building site. It will lead to more last-minute changes because the data can be sent from the office to the site in seconds.

And how will the information be used? Correctly as shown on the drawing or as the worker will interpret it? In the evening, a robot dog will be sent around the building site to record what has actually been built and not what was shown on the drawings, to create something like a digital twin.

INDUSTRIAL THINKING AND THE VALUE OF DATA

Only industrial thinking leads to industrial production. That means that industrial production starts in the design phase. If you want to learn more about industrial production, take a look at other industries such as mechanical engineering or electronics.

In the construction process today, planning

and construction work are carried out in parallel. Why is this being done? Everyone thinks that this saves time and money. But the opposite is true.

Material is wasted due to changes on the building site. Delays occur because important aspects were underestimated in the planning phase. And finally, the quality of the building is lower compared to when it was fully pre-planned.

AI IN THE CONSTRUCTION INDUSTRY

The benefits of AI will arise when data will be available for AI training. However, current BIM models do not contain enough information to be used in an AI model for production. Once we have a lot of BIM models generated in the course of automation, we can hope that AI will be here to stay.

SUSTAINABILITY

When it comes to environmental protection, industrial production is far ahead of on-site production. Industrial production drastically reduces noise, dust and material waste. It is also possible to optimize material consumption as production takes place in a controlled environment in the factory. The time needed on site is also shorter, which means less disturbance for neighbours and less traffic to and from the building site.

IS A REVOLUTION NECESSARY?

Yes, unfortunately we need a revolution to solve the current problems in the housing industry.

But the revolution will not affect 100% of the construction industry or specific buildings, large bridges, etc. There will always be niches where traditional construction is required for different reasons.

The revolution must take place in mass housing construction to solve current problems such as housing shortage, time, labor shortage, quality of buildings, etc. Industrial production does not need skilled labor or many workers on construction sites.

The technology for digitalization is available and affordable, and both society and politics do want it. So let's start using this technology and revolutionize the housing industry worldwide.

Images from top: Production plant in Malaysia; Facade dispatch for multi storey buildings; Assembly area for facade elements